Clock Events Page

Diagnostic events display

Wed, Aug 24, 1994

Introduction

Using the new Tevatron clock event detection hardware on the digital IP board that is part of the Internet Rack Monitor (IRM), it is useful to view the occurrence of clock events in real time. Software support for clock event inter rupts maintains event diagnostic data that can be displayed. This page shows most of that diagnostic data in addition to an on-line picture of clock event activity.

Display layout

```
7 CLOCK EVENTS    08/24/94 1415
NODE<0561> E<18> N= 1383 T=44       Events on captured cycle:
               DELTA=   .066679
..2...6........F.1......8.A.....    02, 06, 0F, 11, 18, 1A
.....5.........................     25
............................
.........................A.C...     7A, 7C

.1.3.............2.............     81, 83, 92
............................
............................
............................
NEVTS=     16110    213 EVTS/SEC
EVTS-HIST:          0 15006   273
      59    37     1    38     0
```

(The picture shown was captured at a random time to illustrate the page.)

Enter the node# on the second line and interrupt to change the display. (It is also activated with the previous node used when the page is first invoked.) On the same display row, the E field is the current selected clock event# of interest. For each event interrupt, when the detected event matches that event#, the IRM software counts the event and captures the time (in ms) that it occurred relative to the cyclic activity of that IRM. These data are displayed on the remainder of that line. On the next line is displayed the delta time in seconds between the last two selected events.

Two areas of four 32-character lines exhibit the clock event activity. The first area shows clock events 00–1F, 20–3F, 40–5F, and 60–7F on successive lines. The least digit of the clock event# is shown whenever that clock event occurs during the previous 15 Hz cycle. These data are updated on the screen at 15 Hz. Events 80–9F, A0–BF, C0-DF, E0-FF above are shown on consecutive lines in the second area.

The statistics toward the bottom of the page show the total number of all events, the number of events detected over the previous second, and the event distribution.

The event distribution shows the number of events detected in the hardware FIFO during each event interrupts. The first three bins (0, 1, 2) are shown on one line, with 3, 4, 5, 6, ≥ 7, shown on the other line. In the example shown, it is clear that almost all event interrupts result in only one event present in the 64-deep FIFO. Two events are found in the FIFO about 1.7% of the time.

Additional details

All statistics are displayed relative to the statistics that were in place when the first reply was received to the data request of that kind of memory data. The total number of events, for example, is the number of events that occurred since the time the data request was sent. A new data request is sent when the node# or selected event# field is changed, or when the page is entered. This feature allows multiple users to view the clock event information without interference. The only resource that is shared is the selected event#. When another user changes the selected event#, it affects the selected-event results obtained by all users. Changing the selected event# on this page, however, restarts the viewed selected event statistics.

Note that if this page is viewed via a "Page G" facility, such as the "VME Screen Image" option of the Macintosh Parameter Page, the data rate and screen update rate should be 15 Hz, or some event activity data may not be seen.

This page application is called EVTS and is written in 680 lines of Pascal that compile into less than 4K bytes. Execution time during 15 Hz updates as measured on two different local station/IRMs is as follows:

CPU board	*CPU*	*Clock,MHz*	*Maximum time/cycle, ms*
MVME-133A	68020	20	2.5
MVME-162	68040	25	1.0